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Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products[1]

This standard is issued under the fixed designation D 5116; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 The use of small environmental test chambers to characterize the organic emissions of indoor materials and products is still evolving. Modifications and variations in equipment, testing procedures, and data analysis are made as the work in the area progresses. Until the interested parties agree upon standard testing protocols, differences in approach will occur. This guide will provide assistance by describing equipment and techniques suitable for determining organic emissions from indoor materials. Specific examples are provided to illustrate existing approaches; these examples are not intended to inhibit alternative approaches or techniques that will produce equivalent or superior results.

1.2 Small chambers have obvious limitations. Normally, only samples of larger materials (for example, carpet) are tested. Small chambers are not applicable for testing complete assemblages (for example, furniture). Small chambers are also inappropriate for testing combustion devices (for example, kerosene heaters) or activities (for example, use of aerosol spray products). For some products, small chamber testing may provide only a portion of the emission profile of interest. For example, the rate of emissions from the application of high solvent materials (for example, paints and waxes) via brushing, spraying, rolling, etc. are generally higher than the rate during the drying process. Small chamber testing can not be used to evaluate the application phase of the coating process.

1.3 The guide does not provide specific guidance for determining emissions of formaldehyde from pressed wood products, since large chamber testing methods for such emissions are well developed and widely used. For more information refer to Test Method E 1333. It is possible, however, that the guide could be used to support alternative testing methods.

1.4 The guide is applicable to the determination of emissions from products and materials that may be used indoors. The effects of the emissions (for example, toxicity) are not addressed and are beyond the scope of the guide.

1.5 As an ASTM guide, options are described, but specific courses of action are not recommended. The purpose of this guide is to increase the awareness of the user to available techniques for evaluating organic emissions from indoor materials/products via small chamber testing and to provide information from which subsequent evaluation and standardization can be derived.

1.6 Within the context of the limitations discussed in this section, the purpose of this guide is to describe the methods and procedures for determining organic emission rates from indoor materials/products using small environmental test chambers. The techniques described are useful for both routine product testing by manufacturers and testing laboratories and for more rigorous evaluation by indoor air quality (IAQ) researchers. Appendix X1 provides additional references for readers wishing to supplement the information contained in this guide.

1.7 The values stated in SI units are to be regarded as standard.

1.8 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 1193 Specification for Reagent Water[2]

D 1356 Terminology Relating to Sampling and Analysis of Atmospheres[3]

D 1914 Practice for Conversion Units and Factors Relating to Sampling and Analysis of Atmospheres[3]

D 3195 Practice for Rotameter Calibration[3]

D 3609 Practice for Calibration Techniques Using Permeation Tubes[3]

D 3686 Practice for Sampling Atmospheres to Collect Organic Compound Vapors (Activated Charcoal Tube Adsorption Method)[3]

[1] This guide is under the jurisdiction of ASTM Committee D22 on Sampling and Analysis of Atmospheres and is the direct responsibility of Subcommittee D22.05 on Indoor Air.

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[2] *Annual Book of ASTM Standards*, Vol 11.01.

[3] *Annual Book of ASTM Standards*, Vol 11.03.

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